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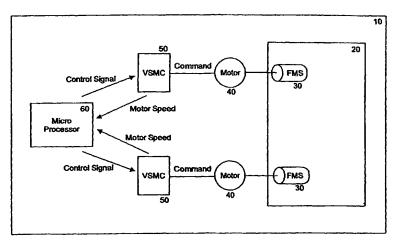
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(54) Title: FLUID FLOW BALANCING SYSTEM



(57) Abstract: The present invention provides an apparatus for controlling a system (10) which includes a fluid conduit network (20) and at least two motors (40) each drivingly engaged with different fluid movement devices (30), the apparatus comprising means for providing a speed signal representative of the speed of each motor and means (50) for providing a control signal in response to the speed of each motor. The apparatus also comprises a means (60) for controlling the speed of each motor in response to the control signal wherein each motor speed is controlled for balancing the rate of fluid movement at an input point and an exit point of the system. A method for controlling a system is also provided under the present invention which includes a fluid conduit network and at least two motors each drivingly engaged with different fluid movement devices, the method comprising the steps of a) sensing the speed signal representative of the speed of each motor in the system, b) generating, by the use of a microprocessor, control signals representing new desired speeds for each motor and c) transmitting a command to each motor in response to the control signals, the command adjusting the motor speeds thereby balancing the rate of fluid movement at an input point and an exit point of the system.





INTERNATIONAL SEARCH REPORT

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Patent family members are listed in annex.

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G05D7/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols) $IPC \ 7 \ GO5D$

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUM	ENTS CONSIDERED TO BE RELEVANT	Solomoto del No
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Х	WO 95 09305 A (DIVERSEY CORP)	1-4,8,9
Υ	6 April 1995 (1995-04-06) the whole document	5-7
1		
Υ	US 4 910 682 A (WOLFF DONALD L ET AL)	5-7
Α	20 March 1990 (1990-03-20) column 11, line 59 -column 13, line 15; figure 2	1-4,8,9
Α .	US 4 108 575 A (SCHAL WILFRIED) 22 August 1978 (1978-08-22) column 3	1,5-7
A	US 4 705 457 A (BELUSA MANFRED L) 10 November 1987 (1987-11-10) the whole document	1-9

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Date of the actual completion of the international search	Date of mailing of the International search report
20 November 2003	02/12/2003
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Philippot, B

Further documents are listed in the continuation of box C.

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Intern:	Application No
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		03) 00010
	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	Relevant to claim No.
Category °	Citation of document, with indication, where appropriate, of the relevant passages	relevant to Cidiff No.
Α	US 5 269 660 A (PRADELLE BERNARD PIERRE) 14 December 1993 (1993-12-14) the whole document	1-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interna	oplication No	
PCT	03/00818	

	1				<u></u>
Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9509305		06-04-1995	AT	166702 T	15-06-1998
MO 3203202	^	00 04 1330	AÙ	698430 B2	29-10-1998
			AU	7735694 A	18-04-1995
			BR	9407705 A	04-02-1997
			CA	2171716 A1	06-04-1995
			WO	9509305 A1	06-04-1995
			DE	69410623 D1	02-07-1998
•			DE	69410623 T2	15-10-1998
			EP	0720693 A1	10-07-1996
			ES	2117801 T3	16-08-1998
			JP	9505863 T	10-06-1997
			PL	313700 A1	22-07-1996
			บร	5509788 A	23-04-1996
			ZA	9407491 A	15-05-1995
		20-03-1990	 US	4715786 A	29-12-1987
US 4910682	Α	20-03-1990		4/15/60 A	
US 4108575	Λ	A 22-08-1978	DE	2535650 A1	10-02-1977
03 41063/3	^		FR	2321147 A1	11-03-1977
			GB	1519415 A	26-07-1978
			ΪŢ	1060800 B	30-09-1982
			ĴΡ	52022393 A	19-02-1977
US 4705457	Α	10-11-1987	NONE		
US 5269660	A	14-12-1993	FR	2664024 A1	03-01-1992
00 0209000	,,	1. 12 1330	AT	101705 T	15-03-1994
			CA	2065252 A1	03-01-1992
			DE	69101216 D1	24-03-1994
			DE	69101216 T2	22-09-1994
			EP	0489150 A1	10-06-1992
			WO .	9200492 A1	09-01-1992
			ΪĒ	912323 A1	15-01-1992
			NO	920797 A	28-02-1992